

## CLIMATOLOGICAL DATA FOR JUNE, 1911.

## DISTRICT NO. 6, MISSOURI VALLEY.

MONTROSE W. HAYES, District Editor.

## GENERAL SUMMARY.

In most of the district dry, hot weather prevailed, and in that portion lying in South Dakota, Nebraska, Kansas, Iowa, and Missouri the temperatures were unusually high, and the precipitation was as light as has ever been recorded in June. At the close of the month agricultural and stock raising interests in practically all of the country to the east of the foothills of the Rocky Mountains were being deleteriously affected by the extreme heat and lack of rain. In much of this territory the rainfall has been deficient throughout the growing season, the subsoil is very dry, and the moisture received by the surface stratum during June soon evaporated under the influence of intense sunshine, high temperatures, and a rather high movement of dry winds. The small streams in the territory lying at a lower elevation than 2,000 feet are very low, and some of them have gone dry. In South Dakota there is a scarcity of water for stock. Pasturage is short everywhere to the east of the foothills. There were several hailstorms in Montana and Wyoming, but in the remainder of the drainage area the month was free from severe local storms, a natural sequence of the deficient rainfall.

## TEMPERATURE.

At the headwaters of the various rivers tributary to the Missouri the mean temperature for the month was either normal or not markedly higher than the seasonal average, but in the remainder of the district unusually warm weather prevailed, and in South Dakota, Nebraska, Kansas, Missouri, and western Iowa the mean was higher than in any other June since state-wide observations have been made. As a rule, the last 15 days were the hottest, but during the first 15 there were few days with a mean temperature below the normal, and there were several days with abnormally high temperatures. In no areas of any considerable extent were there well-marked periods of cool weather or of temperatures that were especially higher than at one or more other times during the month. However, in most of Kansas the 25th was the hottest day, and in parts of Nebraska and western Iowa the 29th was the hottest. To the east of the foothill country there were comparatively few stations that had maximum temperatures of less than 100°. The highest temperature recorded was 116° at Clay Center, Kans., on the 25th.

## PRECIPITATION.

In Montana, the mountain country of Wyoming and Colorado, and in southwestern North Dakota there were localities that had more than the normal precipitation, but in the remainder of the district there was a decided deficiency, that was most pronounced from South Dakota

southward and southeastward. In this region of especially deficient precipitation the month just ended was the driest of all the Junes in which the observations were sufficiently extensive to render the conditions comparable. Large areas in Missouri and Kansas had less than 20 per cent of the normal rainfall, restricted localities had even less, and individual stations, confined to no particular section, had mere sprinkles. Progressing in a northerly and westerly direction the deficiency decreased, but in all the country east of the foothills it was unusually great. In Colorado and Wyoming most of the rain occurred during the latter half of the month, and in eastern Nebraska and western Iowa light showers were fairly general from the 14th to the 17th. In the remainder of the district the showers were very widely scattered, both geographically and through the month.

## RIVERS.

The rivers continued exceptionally low. The Mississippi at St. Louis was lower than ever before recorded in June, and the highest stage for the month (10.5 feet) was lower than the lowest readings for 45 of the last 50 years.

The following remarks, taken from the reports of the section directors of the various States that lie entirely or partly in the Missouri River drainage area, are considered of especial interest in view of the dry weather that has prevailed over a large part of the drainage area:

*Montana.*—The precipitation was quite irregularly distributed, but generally was in excess of the normal. In a few localities there was a marked excess, while in others there was a decided deficiency. The monthly totals as a rule were lightest in the eastern counties, but comparatively few stations had less than 2 inches and many of the mountain stations had more than 4 inches. June has been wetter 7 times in the last 17 years, and the average for the driest June of this period was about 1 inch in 1900; the average of June of this year was 2.65 inches, or 0.24 inch above the normal. The rains were well distributed through the month and most of the moisture was absorbed by the soil. Hail storms occurred in various localities, but most of them were light and did little damage. The severest reported was in northern Yellowstone County, near Lavina. Its path was about 1 mile wide; within it growing wheat was destroyed and sheep were killed by hailstones, many of which were as large as hen's eggs.

*Wyoming.*—Dry weather prevailed during the first two weeks; general rains occurred on the 14th and 15th, filling the streams and restoring vegetation to normal condition. Hail occurred at a number of stations on the 8th, 9th, 22d, and 23d.

*Colorado.*—Droughty conditions prevailed during the greater portion of the month, and there was little rain before the 15th. Scattered showers occurred during the latter half of the month, and the greater part of the monthly precipitation occurred from the 15th to the 17th, inclusive. The monthly amounts were considerably less than the normal, except at some of the extreme western stations.

*North Dakota.*—The average precipitation was 2.81 inches, or 0.84 inch below the normal. Although the rains were fairly well distributed geographically and through the month, some localities were in great need of moisture at the close of the month.

*South Dakota.*—Over the western portion of the State showers were insufficient and drought of a varying degree of severity prevailed most of the time, resulting in short pasturage, scarcity of water for live stock

except in the Black Hills, a poor outlook for hay, and serious damage to small grains and other crops. The shipping of live stock from that section of the State has been excessive for the season. Many new settlers on land between the Missouri River and the eastern border of the Black Hills have been forced to move out. In parts of that section some of the seeds sown did not come up, owing to dry soil, and in places there was little new pasturage until near the middle of June. There were, of course, some localities that were favored with good showers and severe damage was averted. The eastern portion of the State fared somewhat better in the matter of rainfall, but there also insufficient moisture, with excessive heat and sunshine, caused serious damage to small grains and grasses in most counties, although there were limited localities where opportune rains prevented serious damage. In this section corn did well; it made unusual progress for the season on account of the warm nights. The grass crop, however, is short and under the most favorable conditions from now till the close of the season its yield can hardly be other than deficient. Owing to drought, and in some cases to lightning, fires were numerous in the Black Hills, and tree seeds sown on 1,000 acres in the national forest have not germinated properly. In all portions of the State conditions resulting from insufficient rainfall and excessive heat have been intensified by the dry state of the subsoil at the beginning of the season.

*Nebraska*.—June, 1911, was the warmest and driest recorded since 1876. The records in the State extend back to 1849, but previous to 1876 the number of stations was small. The 8 stations with a record in 1870 and the 3 in 1857 and 1859 indicate that the rainfall in those three years was as light, or probably lighter, in June than in the month just passed. The deficiency in rainfall was greatest in the southeastern section, as it averaged less than one-sixth of the normal and for considerable areas the total fall for the month was about half an inch. In parts of the central and northeastern sections the rainfall was normal, or slightly more than normal; this also was the case in the North Platte Valley. The cloudiness was much less than the average for the season. The mean for the entire State was 20 clear days, 9 partly cloudy, and 1 cloudy, a remarkable record for June in Nebraska.

*Kansas*.—The maximum temperatures were above 100° at every station. They were 110° or more in the Smoky Hill Valley from Gove County eastward, in the Solomon Valley from Osborne south, in the Republican Valley from Republic County south, and in the Blue Valley. In the Kansas Valley they ranged from 112° at the mouth of the Republican to 100° at Kansas City, Mo. The precipitation was below normal at all stations. The average number of rainy days was 3, the smallest number on record. No April, May, June, July, August, or September since records began has been as dry as June, 1911. Hot winds occurred on several days.

*Iowa*.—June is usually a wet and cool month in this section, but this year the temperatures were abnormally high and the rainfall was exceptionally light, except at a few stations in the extreme northern part of the State, where moderately heavy showers occurred on the night of the 25th. However, there was only one station that received an excess of moisture. The showers were light, widely scattered, and occurred at long intervals, except between the 14th and 17th, when they were quite general, but even then the amounts were small at most stations. The temperatures were high most of the time. The intense sunshine, and long-continued drought and the excessively high temperatures were damaging to all late crops except corn, and that was injured to some extent where the drought was most severe.

*Missouri*.—The month was the warmest and driest June of which we have a record. Both the heat and the dry weather began early in May, and high temperatures were continuous, save a few short interruptions. The areas in which the period of dry weather was broken by beneficial showers were scattered and limited in extent. At the close of the month pastures were as dry and brown as in late summer, and most crops had suffered. All streams were low and some were completely dry. In the southwestern part of the State it was reported that many wells had gone dry, and some of them were reported never to have failed before in the last 40 years or more.

#### THE EROSION OF SIOUX POINT, SOUTH DAKOTA.

By G. W. McDOWALL, Local Forecaster, United States Weather Bureau.

Within the past few years the Missouri River has encroached rapidly upon the South Dakota shore line for a distance of 3,000 yards above the junction of the Missouri and Big Sioux Rivers. Little attention was paid to the cutting till 1909, as no immediate loss was threatened except that of pasture and cultivable land. About that time it was feared that, unless checked, it might soon devour all of Sioux Point and reaching across the present bed of the Big Sioux destroy the Iowa shore as far back as the bluffs. This would include the fair-

grounds and boat-club properties as well as the electric and C. M. & St. P. Railway tracks, and cause the inundation of lowlands on both sides of the Big Sioux for one-half mile upstream.

In 1910 an appropriation of \$32,500 was granted by the Government for the purpose of shore protection along this bank on condition that an equal amount be raised by local subscription. The money was not raised, as it was thought the channel would automatically shift southward, but cutting continued at such a rapid rate that conditions became critical during the spring of 1911, and the conclusion was unavoidable that immediate action was necessary to save the threatened properties. A delegation was sent to Washington in June, and an increased appropriation was secured, leaving but \$16,000 to be raised locally. About \$11,000 of this has been pledged and the remainder is in sight. It is intended to protect the shore by ripraping from Gumbo Point to Sioux Point, a distance of about 3,500 yards. A woven mat, 75 to 80 feet wide, will be used, one side being ballasted with rock and sunk in the stream, the other reaching up over the bank. The bank will then be rock paved over its entire face. About 1,500 yards from Sioux Point a dike will be built to deflect the current. Requisition has been made for the necessary materials and these are being gathered as rapidly as possible. Plans are under way to commence construction within a few days and the completion of the work is expected this summer.

The soil of the threatened bank is of gumbo and sand composition and offers little resistance to the encroaching stream. Nearer the junction of the streams the shore is heavily wooded and the work of the river has been materially hindered by the tree roots. The bank rises almost 15 feet above the present surface of the water till within 300 yards of Sioux Point, whence it is little more than 3 feet above the stream. A river stage of 14 feet would submerge this lowland and it would be swept away almost at once. Another source of danger is the old river bed paralleling the shore line for several hundred yards and only distant therefrom a few rods. Upon the first breach in this wall the water will pour through the old channel and it will be too late to save Sioux Point.

#### FLOODS OF THE UPPER MISSOURI RIVER.

By C. D. REED, Local Forecaster, United States Weather Bureau.

Little has been published on the subject of flood conditions and fluctuations of river stages in the upper Missouri River. It is therefore hoped that this short article, treating of some phases of the subject, may be interesting to those who are now trying to revive navigation, to those who are engaged in bank protection and other works of construction along the stream, and to the many farmers who venture to till the broad acres of unusually fertile land subject to occasional overflow that lie adjacent to the river through several States.

The conclusions reached proceed from 10 years' study of the stream, during a considerable portion of which the writer was in charge of the river and flood service of the Weather Bureau on the Missouri River and tributaries at and above Sioux City, Iowa. The scope of the paper will therefore be confined to that portion of the river.

The drainage area of the Missouri River above Sioux City includes four-fifths of Montana, considerable territory in the Provinces of Alberta and Saskatchewan in









TABLE 1.—*Climatological data for June, 1911. District No. 6—Continued.*



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Stations.	Counties.	Elevation, feet.	Length of record, years.	Temperature, in degrees Fahrenheit.								Precipitation, in inches.								Sky.	Prevailing wind direction.	Observers.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall, unmeted.	Number of rainy days 0.01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.				
<b>Kansas—Contd.</b>																						
Plainville.	Rooks.	2,156	5	79.8	101	25	54	13	36	0.45	0.25	0	2	28	2	0	s.	P. D. Spellman.				
Pleasanton.	Linne.	802	9	80.3	111	25	50	21	50	0.67	0.46	0	4	27	2	1	sw.	B. F. Blaker.				
Republic.	Republic.	1,495	8	80.4	113	25	44	13	51	0.36	0.33	0	3	26	3	1	s.	J. W. Ambrose.				
Russell.	Russell.	1,634	12	80.4	107	24	45	12	51	1.02	0.26	0	2	26	3	1	se.	Robert Brebner.				
Russell Springs.	Logan.	1,782	3	77.5	107	28†	34	12	48	0.34	0.52	0	3	21	7 <sup>a</sup>	1	s.	D. J. Hutto.				
St. Francis.	Cheyenne.	3,288	3	78.2	114	25	52	13	39	1.01	0.23	0	3	18	11	1	s.	J. E. Uplinger.				
Salina.	Saline.	1,227	27	81.2	+ 7.6	114	25	52	13	39	3.78	0.34	0	20	9	1	s.	Prof. A. W. Jones.				
Scott.	Scott.	2,971	5	78.2	108	24†	48	12	46	0.74	0.43	0	3	20	10	0	s.	J. B. Loughran.				
Smith Center.	Smith.	1,800	1	80.5	+ 7.3	106	25	57	13	31	1.04	0.73	0	2	19	11	0	se.	W. H. Nelson.			
Topeka.	Shawnee.	967	25	80.8	+ 7.3	106	25	57	13	31	0.55	— 4.26	0.32	0	4	24	4	2	se.	U. S. Weather Bureau.		
Valley Falls.	Jefferson.	913	12	79.6	+ 7.0	104	25	52	13	35	1.02	— 3.72	0.32	0	4	21	7	0	se.	Miss Nettie Maxwell.		
Vinland.	Douglas.	880	2	80.4	110	25	52	13	48	0.64	0.53	0	3	24	4	2	s.	A. Schick.				
Wakeeney.	Trego.	2,456	28	79.2	+ 6.8	110	25	52	13	48	0.45	— 2.70	0.13	0	4	28	2	0	se.	A. S. Peacock.		
Wallace.	Wallace.	3,303	41	77.7	104	24	47	12	48	1.26	— 1.24	1.06	0	3	7	22	1	sw.	M. T. Griggs.			
Wamego.	Pottawatomie.	1,002	18	80.4	104	24	52	12	48	0.03	— 5.24	0.03	0	1	18	9	3	sw.	M. L. Stone.			
<b>Missouri.</b>																						
Amoret.	Bates.	850	3	80.8	103	16†	53	13	40	0.66	— 5.12	0.32	0	3	19	4	7	sw.	Darby fruit farm.			
Appleton City.	St. Clair.	853	21	80.8	+ 6.6	106	24	55	1	40	0.81	— 5.35	0	5	12	16	2	sw.	T. C. Brown.			
Arlington.	Phelps.	695	22	80.8	107	16	54	14	42	2.07	— 1.74	0.70	0	5	15	9	6	s.	George V. Randolph.			
Arthur.	Vernon.	767	19	78.9	+ 6.4	102	16	54	14	42	0.56	— 6.07	0.30	0	3	15	15	0	sw.	J. T. Armstrong.		
Avalon.	Livingston.	25	79.2	+ 7.2	101	16†	56	13†	37	0.45	— 4.61	0.25	0	2	25	4	1	sw.	F. G. Ashbaugh.			
Bagnell.	Miller.	594	22	78.4	+ 7.0	99	30	54	14	32	1.08	— 3.21	0.73	0	2	26	3	1	sw.	W. S. Brockman.		
Bethany.	Harrison.	881	22	78.6	+ 6.5	102	10	50	14	41	2.22	— 3.34	1.46	0	6	18	12	0	sw.	W. H. Skinner.		
Bolivar.	Polk.	1,070	24	78.6	102	10	50	14	41	1.06	— 4.88	0.26	0	7	18	5	7	se.	C. Randecker.			
Boonville.	Cooper.	600	36	80.8	+ 7.6	102	5†	50	1	38	0.42	— 5.27	0.15	0	5	18	6	6	s.	Louis Beneke.		
Brunswick.	Charlton.	652	31	80.8	+ 7.6	102	5†	50	1	38	0.42	— 5.27	0.15	0	6	19	10	1	s.	U. S. Weather Bureau.		
Columbia.	Boone.	784	22	78.7	+ 4.2	102	10	54	1	34	0.59	— 3.79	0.15	0	6	19	8	1	s.	Fr. Adhelm Hess.		
Conception.	Nodaway.	982	28	78.4	+ 7.7	100	8†	52	17	31	0.62	— 4.14	0.30	0	3	21	8	1	sw.	Samuel Graham.		
Eldorado Springs.	Cedar.	750	6	80.6	110	21	55	13	50	2.00	0.57	0	4	19	8	3	s.	Prof. T. Berry Smith.				
Fulton.	Howard.	725	29	79.5	+ 6.3	100	10†	58	1	31	0.83	— 4.08	0.37	0	5	24	3	3	s.	Dr. J. L. Brennenman.		
Glasgow.	Callaway.	818	20	80.4	106	29	50	1	31	0.53	— 4.14	0.36	0	4	23	4	3	se.	J. J. Shaughnessy.			
Grant City.	Howard.	618	34	80.6	106	29	50	1	31	0.68	— 3.90	0.42	0	3	26	2	3	sw.	W. H. Campbell.			
Harrisonville.	Worth.	1,130	20	78.6	103	29	50	28	47	1.06	— 3.64	0.30	0	5	15	7	8	sw.	A. J. Sharp.			
Hazelhurst.	Cass.	912	39	82.0	+ 8.8	106	10	58	1†	41	0.11	— 4.05	0.05	0	4	27	0	3	sw.	W. H. Baker.		
Livingston.	Hermann.	19	79.1	80.9	103	10†	54	13	37	2.09	— 2.58	0.70	0	9	16	5	9	e.	C. T. Maushund.			
Houston.	Gasconade.	482	38	76.9	+ 5.0	101	10†	50	13†	44	3.07	— 2.11	1.17	0	6	6	24	0	s.	E. Dempsey.		
Jefferson City.	Texas.	1,280	19	76.9	101	10†	54	13†	37	0.96	— 3.36	0.28	0	8	25	0	5	s.	Miss Emma Swift.			
Kansas City.	Jackson.	628	30	78.4	+ 4.4	103	30	55	1†	37	0.33	— 4.33	0.13	0	5	15	14	1	s.	U. S. Weather Bureau.		
Kidder.	Caldwell.	963	22	80.8	+ 7.3	100	25	62	13	28	0.33	— 4.48	0.20	0	4	22	6	2	sw.	J. F. Sharp.		
Lamonte.	Pettis.	1,017	19	78.4	+ 6.4	99	26†	54	13	29	0.36	— 4.48	0.20	0	4	26	6	2	sw.	Dr. W. E. Walker.		
Lebanon.	Laclede.	863	23	80.9	103	10†	54	13	37	2.54	— 2.26	0.70	0	6	10*	8*	5*	s.	M. W. Serl.			
Lexington.	Lafayette.	1,265	23	78.8	+ 3.8	101	9	50	1	39	1.77	— 3.74	1.10	0	4	15	10	5	s.	J. W. Keithley.		
Liberty.	Clay.	813	30	79.8	+ 7.6	101	10†	56	1	34	0.28	— 4.95	0.20	0	3	27	0	3	s.	W. C. Wilmott.		
Lockwood.	Dade.	864	23	80.7	+ 7.4	102	8†	57	2	42	0.08	— 5.13	0.08	0	1	19	11	0	sw.	C. S. Crow.		
Marshall.	Saline.	1,088	17	80.4	102	10	55	15	35	1.55	— 3.47	1.02	0	5	25	5	0	sw.	Dr. W. H. Black.			
Marshfield.	Webster.	779	18	79.3	+ 6.7	101	16	50	1	34	0.24	— 4.71	0.20	0	2	26	5	0	sw.	C. A. McCombs.		
Maryville.	Nodaway.	1,160	23	77.6	+ 7.1	100	25†	56	13	37	1.06	— 3.95	0.58	0	4	21	6	3	s.	J. R. Brink.		
Mt. Vernon.	Lawrence.	1,480	33	79.1	+ 5.9	101	17	50	13	41	4.35	— 0.97	1.82	0	7	19	7	4	sw.	J. R. White & Son.		
Nevada.	Vernon.	860	18	80.0	100	8	58	13	32	0.27	— 4.82	0.10	0	5	16	11	3	se.	C. Jewell.			
Oregon.	Holt.	1,113	56	77.0	+ 4.7	100	25	56	13	35	0.28	— 4.62	0.09	0	4	22	4	4	se.	Tom Curry.		
Osceola.	St. Clair.	738	12	80.4	101	30	51	1	34	0.91	— 3.31	0.53	0	5	22	5	3	se.	W. E. Matthews.			
Fattnsburg.	Davies.	2	79.1	80.4	100	30	52	12	30	0.61	— 4.48	0.02	0	2	26	0	5	se.	Wm. Burton.			
Rolla.	Phepes.	1,062	31	78.4	+ 6.8	100	9†	57	13	37	1.96	— 2.51	0.71	0	9	19	4	7	se.	Prof. P. J. Wilkins.		
St. Charles.	St. Charles.	614	34	81.4	+ 7.8	102	16	54	1	36	1.61	— 2.50	0.83	0	5	21	5	4	s.	L. C. Saeger.		
St. Joseph.	Buchanan.	825	40	80.0	100	8	58	13	32	0.27	— 4.82	0.10	0	5	16	11	3	se.	U. S. Weather Bureau			
St. Louis.	St. Louis City.	567	46	79.4	+ 4.3	98	10	63	1	27	1.34	— 3.13	0.48	0	8	12	13	1	se.	Do.		
Sublett.	Adair.	1,000	32	79.0	+ 7.4	101	30	51	1	34	0.40	— 4.33	0.35	0	2	14	15	1	sw.	Lewis Spriggs.		
Trenton.	Grundy.	812	17	78.6	+ 6.7	98	30	56	13	30	1.12	— 3.08	0.44	0	5	25	3	2	s.	W. H. Estes.		
Unionville.	Putnam.	1,072	19	77.2	+ 5.0	100	30	52	28	37	0.48	— 4.07	0.30	0	3	20	5	5	s.	Geo. W. Davis.		
Warrensburg.	Johnson.	883	33	80.6	+ 6.8	101	8†	56	1	34	0.67	— 4.31	0.25	0	5	21	8	1	sw.	A. F. Smithson.		
Warrenton.	Warren.	845	22	76.3	+ 3.0	103	16	56	1	34	1.75	— 2.78	0.64	0	8	15	6	9	sw.	Dr. John H. Frick.		
Warsaw.	Benton.	700	8	79.7	105	10	45	1	42	1.48	— 3.02	0.52	0	9	17	12	1	sw.	Dr. J. R. Smith.			
Wheatland.	Hickory.	920	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Mrs. S. A. Jackson.		

<sup>a</sup>, <sup>b</sup>













TABLE 3.—Maximum and minimum temperatures at selected stations for June, 1911. District No. 6, Missouri Valley.

Date.	Wyoming.												Montana.																
	Basin.		Cheyenne.		Fort Laramie.		Lander.		Newcastle.		Pathfinder.		Sheridan.		Yellowstone Park.		Billings.		Dillon.		Havre.		Helena.		Lewis-town.		Malta.		
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
1...	89	53	80	51	90	49	75	45	85	50	76	43	76	52	55	40	65	53	73	37	78	57	69	53	67	52	78	57	
2...	78	45	79	46	86	53	73	38	86	52	76	39	77	46	57	42	69	52	78	38	72	51	74	48	67	50	68	54	
3...	81	45	75	46	86	51	76	40	84	48	77	46	77	46	63	45	81	45	79	40	80	52	74	46	73	42	78	51	
4...	87	43	82	45	94	41	81	47	92	51	82	45	89	45	64	39	82	50	68	40	84	45	61	41	63	41	80	52	
5...	89	45	79	52	80	49	77	42	86	58	79	50	69	43	61	32	72	42	72	32	67	46	66	38	68	37	70	44	
6...	92	46	81	47	91	48	82	40	86	56	84	47	80	38	71	36	84	39	78	36	78	43	73	40	78	36	78	52	
7...	86	45	86	55	99	59	81	48	94	66	81	51	89	53	68	42	90	52	72	38	70	54	65	49	67	52	81	57	
8...	82	43	81	58	90	65	79	54	86	68	70	52	83	54	60	40	80	50	75	37	68	50	56	47	67	42	72	51	
9...	89	45	78	53	89	58	82	43	84	56	74	49	68	47	59	41	70	50	80	41	75	52	65	46	65	45	76	51	
10...	91	47	72	44	83	47	77	36	71	45	79	40	74	46	72	42	79	47	82	41	77	55	75	52	72	49	79	49	
11...	92	45	77	43	84	45	81	46	72	47	79	43	80	46	80	43	78	46	85	43	82	45	85	50	78	42	78	44	
12...	95	50	86	47	92	40	90	48	92	45	91	49	91	46	81	46	86	48	87	45	84	53	83	57	84	52	86	53	
13...	86	53	85	49	93	53	80	53	90	62	88	54	84	56	78	46	84	60	84	46	83	56	79	53	82	47	87	54	
14...	84	60	82	53	89	55	82	49	88	58	86	50	81	54	19	49	85	54	82	45	83	60	80	56	79	57	78	59	
15...	76	58	72	54	94	59	60	54	85	60	75	53	63	59	55	43	76	58	83	42	78	51	72	53	70	48	76	53	
16...	80	50	54	48	63	55	66	52	76	58	62	49	75	55	71	41	80	47	85	40	86	53	81	50	71	46	83	49	
17...	86	53	70	50	77	48	73	48	81	50	76	44	82	48	73	47	89	48	86	44	88	60	82	54	80	49	85	55	
18...	89	55	76	47	86	53	80	47	90	52	85	51	86	54	77	41	92	47	86	43	91	63	79	55	88	47	93	54	
19...	90	56	80	51	91	55	80	50	92	60	88	56	90	53	72	51	95	50	85	39	93	64	81	56	90	52	97	62	
20...	93	59	83	55	93	60	78	49	94	67	88	54	85	58	73	48	88	56	80	37	84	57	78	55	81	53	87	59	
21...	92	60	80	54	86	57	80	49	90	62	81	58	79	58	72	49	84	60	82	40	81	63	80	52	80	56	80	62	
22...	91	56	81	54	88	59	59	46	92	62	88	56	86	53	77	47	91	55	80	41	93	64	88	54	82	57	77	63	
23...	89	57	82	51	89	54	82	46	90	56	87	53	89	56	75	46	89	57	81	37	79	60	87	56	92	58	82	53	
24...	80	50	85	51	92	55	76	49	91	62	82	53	82	49	55	43	80	53	83	42	71	50	82	45	71	53	74	52	
25...	76	45	75	51	83	54	75	46	82	56	74	54	75	43	60	37	74	47	86	48	62	50	63	49	67	51	76	50	
26...	78	58	70	46	79	51	73	43	74	48	81	46	73	45	69	36	77	45	85	48	70	47	76	43	74	36	66	48	
27...	81	49	83	45	93	49	85	47	84	44	86	52	90	47	73	44	84	44	86	50	80	46	75	52	73	48	84	48	
28...	89	51	87	52	96	60	78	50	92	67	84	59	79	52	60	45	80	52	76	40	73	58	68	50	73	52	75	53	
29...	92	54	83	51	91	51	84	51	95	65	84	53	89	49	54	43	77	49	80	37	77	57	66	46	77	41	78	51	
30...	91	48	82	61	93	63	78	53	94	67	85	59	84	50	62	40	78	59	80	40	70	56	61	46	61	45	77	50	
Mns..	86.5	50.2	78.9	50.4	87.7	53.2	77.5	47.0	86.3	56.6	81.1	50.3	80.7	50.0	67.3	42.8	81.3	50.8	80.1	40.8	77.9	54.0	73.0	49.8	74.7	48.0	79.2	53.2	
Date.	Montana.						North Dakota.						South Dakota.						Rapid City.										
	Miles City.		Poplar.		Berthold Agency.		Bismarck.		Dickinson.		Jamestown.		Williston.		Aberdeen.		Huron.		Kadoka.		Kimball.		Lemmon.		Pierre.				
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
1...	70	52	72	51	84	48	81	58	78	52	69	53	74	54	90	58	81	62	94	63	88	58	.....	91	64	90	59	.....	59
2...	74	53	68	48	63	50	74	59	66	53	69	59	65	51	87	62	88	64	91	52	89	62	.....	92	64	86	52	.....	59
3...	81	55	80	50	78	50	80	53	87	56	71	49	77	49	88	57	92	64	89	56	89	63	.....	89	62	79	50	.....	59
4...	94	56	89	49	87	48	84	54	82	41	70	59	88	53	85	57	90	56	97	54	93	55	.....	89	57	94	56	.....	59
5...	70	52	72	48	75	56	71	51	67	53	69	62	67	52	73	65	80	56	82	60	79	62	.....	84	60	76	50	.....	59
6...	84	46	83	46	84	42	82	46	89	51	74	42	81	49	80	44	80	46	85	50	79	63	.....	80	51	88	45	.....	59
7...	92	63	92	57	85	54	88	59	77	49	79	49	85	56	85	52	87	54	96	56	88	57	.....	80	64	93	59	.....	59
8...	82	58	77	54	86	58	80	67	84	57	77	51	86	58	90	55	97	68	98	65	97	63	.....	95	70	90	67	.....	59
9...	64	57	69	53	80	55	72	54	71	55	75	54	66	54	91	65	98	65	95	63	99	65	.....	95	63	78	56	.....	59
10...	76	56	72	51	76	56	78	52	75	64	72	52	76	53	80	54	80	55	96	56	90	57	.....	83	56	77	51	.....	59
11...	78	54	78	48	73	52	70	55	72	47	71	49	72	52	76	53	76	58	83	50	95	55	.....						

## MONTHLY WEATHER REVIEW.

JUNE, 1911

TABLE 3.—Maximum and minimum temperatures at selected stations for June, 1911. District No. 6—Continued.

Date.	South Dakota.						Colorado.						Nebraska.															
	Sioux Falls. <sup>ss</sup>		Water-town. <sup>ss</sup>		Yankton.		Denver.		Wray.		Alma.		Bridge-port.		Grand Island. <sup>ss</sup>		Hay Springs.		Ilebron.		Lincoln.		North Platte.		Oakdale.			
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
1.....	85	50	79	55	83	61	87	58	88	58	90	66	91	54	89	63	87	50	86	61	84	62	89	62	87	60	80	64
2.....	93	55	87	58	89	62	84	50	90	57	98	68	87	45	79	73	86	48	98	72	100	70	89	58	92	65	98	68
3.....	96	66	85	63	90	70	84	48	87	54	87	63	86	43	81	65	88	48	97	67	89	59	91	60	97	73	98	73
4.....	94	60	88	57	91	61	88	49	91	49	101	60	93	42	100	65	90	45	98	65	97	67	93	54	94	60	96	71
5.....	88	54	82	62	84	57	86	60	86	48	99	68	79	48	81	68	80	50	96	64	99	72	81	56	90	55	98	73
6.....	89	62	80	46	80	53	86	55	80	52	90	62	84	45	86	57	82	42	84	58	83	61	83	48	89	50	82	63
7.....	90	67	87	54	88	60	90	60	96	57	104	63	91	45	92	68	92	42	92	67	93	62	94	58	89	58	89	65
8.....	102	71	97	65	100	75	87	61	94	58	102	76	94	55	104	74	82	42	101	70	102	73	93	63	100	65	102	73
9.....	97	72	97	64	99	66	86	60	94	56	99	64	90	51	100	72	85	55	100	71	100	76	93	56	100	63	100	74
10.....	90	60	83	55	78	59	78	48	80	49	88	54	80	46	85	62	78	48	85	66	83	64	78	51	78	59	83	71
11.....	69	55	71	51	76	59	82	51	86	48	88	55	80	45	88	67	88	40	87	55	86	59	82	51	79	56	84	65
12.....	82	52	74	49	79	55	86	55	87	42	87	49	83	38	84	53	89	52	82	55	82	43	84	43	79	55	80	62
13.....	78	50	76	45	79	54	89	63	97	49	93	50	93	50	92	54	86	50	88	55	91	52	87	50	82	61	94	61
14.....	91	53	82	44	84	57	84	58	93	56	98	62	88	53	90	66	86	56	89	65	97	64	89	59	84	62	92	67
15.....	90	59	87	54	91	65	76	60	91	60	100	70	... ...	...	99	64	70	56	98	65	96	65	93	58	94	60	92	67
16.....	96	60	76	59	85	68	66	53	73	58	90	62	89	40	87	69	80	50	91	69	93	69	79	61	86	65	92	69
17.....	90	62	80	57	84	62	70	52	77	55	80	62	79	53	83	63	83	48	78	68	78	65	81	60	82	62	77	65
18.....	92	65	85	51	86	58	83	51	84	51	87	59	85	50	86	67	83	48	86	60	80	59	84	53	85	58	83	63
19.....	95	60	90	57	89	59	84	58	83	55	91	54	85	56	91	56	86	52	90	54	89	58	86	55	89	52	87	64
20.....	97	65	90	59	91	62	86	62	90	60	95	64	88	58	90	65	91	57	93	54	93	57	90	56	93	59	90	68
21.....	97	67	94	61	95	68	96	59	92	61	96	60	90	55	98	65	91	70	96	59	96	65	93	61	96	61	95	72
22.....	99	69	98	60	97	67	92	58	95	59	98	62	90	55	100	66	93	52	98	63	98	62	95	66	98	58	96	74
23.....	100	67	96	64	97	72	91	56	96	58	100	68	91	55	100	68	93	52	98	65	94	66	95	61	99	59	91	72
24.....	101	68	96	65	97	71	95	61	100	60	103	68	100	55	102	73	95	54	101	71	100	71	97	67	100	67	96	72
25.....	105	65	95	71	94	72	80	61	92	58	103	74	88	57	101	76	90	55	105	78	103	73	92	60	95	66	98	68
Mns.....	91.2	60.7	85.6	56.3	87.7	63.0	84.5	56.9	90.1	56.9	94.7	63.2	88.8 <sup>b</sup>	51.3 <sup>b</sup>	91.9	60.0	85.8	51.1	92.8	64.3	92.1	65.3	89.3	58.1	89.6	59.6	90.0	68.2

Date.	Iowa.						Kansas.										Missouri.									
	Valentine, Nebr.		Clarinda. <sup>ss</sup>		Sibley. <sup>ss</sup>		Sioux City.		Colby.		Concordia.		Salina.		Topeka.		Wakeeney.		Columbia.		Kansas City.		St. Louis.		Unionville. <sup>ss</sup>	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1.....	93	65	73	55	78	51	78	60	93	53	88	65	90	68	81	60	91	62	79	54	79	63	81	63	80	53
2.....	91	57	98	58	87	57	95	67	98	64	96	74	93	62	97	69	94	64	97	65	98	70	86	65	93	64
3.....	87	58	88	67	93	64	92	71	85	57	93	69	93	71	94	73	92	66	97	74	95	77	96	76	94	64
4.....	95	50	99	66	92	60	93	67	98	56	97	71	96	72	94	74	98	60	97	71	95	75	97	78	95	71
5.....	77	53	100	67	95	60	94	65	93	56	97	66	98	70	97	73	101	62	97	71	98	78	95	78	96	70
6.....	78	47	66	62	81	54	70	57	90	53	89	66	90	67	91	72	95	59	84	67	88	72	83	68	86	62
7.....	90	58	85	61	88	54	85	62	102	59	94	70	98	68	91	69	104	59	86	64	85	68	86	79	67	80
8.....	96	64	102	65	100	63	101	72	102	69	103	74	103	69	101	73	102	72	95	68	100	73	90	67	95	61
9.....	83	62	100	69	97	70	99	72	98	62	99	74	100	77	99	76	99	72	100	73	98	79	98	72	98	70
10.....	76	65	90	72	81	64	80	66	90	56	88	63	96	71	91	71	87	62	102	68	94	76	98	75	95	72
11.....	78	53	78	60	74	57	78	62	89	51	90	59	90	66	90	63	91	55	89	67	88	65	94	64	98	64
12.....	81	47	72	58	80	53	80	56	89	48	85	55	83	54	83	60	90	53	89	68	81	63	78	68	80	58
13.....	87	51	80	52	79	51	82	54	99	59	88	55	87	52	88	57	98	52	85	55	85	62	83	65	86	55
14.....	84	57	70	60	84	53	84	58	96	54	95	66	99	62	90	66	88	55	81	55	85	64	81	87	58	
15.....	91	60	86	60	87	55	86	64	87	61	98	67	97	69	95	68	97	66	93	62	95	68	95	66	90	60
16.....	75	62	97	64</																						